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I met the Norwegian cognitive scientist Preben Wik at The European Cetacean Society's 2003 conference held in the Canary Islands. Despite the event's stated theme of cetacean acoustics, not one talk confronted the conscious depths of whale communication. No one mentioned language. Preben's paper, entitled Building Bridges: A Cognitive Science Approach To A Human Dolphin Dialog Protocol, *was the lone exception, a clear statement about the use of digital technology and linguistics to bridge the interface barrier between humans and dolphins. Unfortunately, the judges made the rather political decision to keep his paper off the podium, relegating it instead to the poster section of the conference. You can read the paper for yourself at: http://bridges.prebenwik.com*

I asked Preben to write something for this newsletter that would explain his ideas for an educated group of lay people who possess a keen interest in interspecies communication. Here is the result.

—Jim Nollman, March 2004

What should we talk about?

Human beings are smart creatures; impressively so. The combination of big brains and opposable thumbs have made us masters of gadget-making in the animal kingdom. Perhaps the greatest innovation of mankind – language – has provided us with the ability to build upon previously acquired knowledge, and pass it on from generation to generation. Language has opened up a new kind of evolution: cultural evolution, which has brought us from the Stone Age to the Information Age. Today, our knowledge is vast in many areas, whereas other areas are still largely uncharted.

I work with Artificial Intelligence, language technology, and human-computer dialog systems. More specifically, I'm currently working on a 'virtual language tutor'. That is, a 3D animated head that you can talk to, and that talks back. In AI terms, we call them 'Embodied Communicative Agents'. The domain of this particular ECA is in language learning.

In my line of work we look at human behavior and human minds and try to figure out how things work. We try to mimic human behavior as well as possible, in order to improve human-computer communication and interaction. We ask questions like:

What does a computer need to know in order to keep a meaningful conversation with a human being? What kind of structures are needed in order to process our kind of language?

I have noticed that many of the questions being posed in a human-computer dialog research environment can also be applied to a human-dolphin dialog research environment. However, the questions we ask and the answers we seek are quite different from what is customary in animal behavioral research.

We can not assume that our agents have a 'Language Acquisition Device' (LAD). Nor can we conclude that if the agent does not have a LAD, there is no point in trying to communicate with them using language. We look at how language is constructed, what the constituents are, what kind of building blocks are needed to create words, conceptual structures, sentences, and dialogs. Rather than asking "What is it reasonable to assume that the agent can grasp?" we might ask: "What does an agent need to grasp, in order to say something significant?" And "what does it mean to grasp something?" This in turn leads to more specific questions like:

"Which words are needed in the agent's vocabulary to express something significant?" And the underlying question to this would be: "What does 'something significant' really mean"?

If...Then

With dolphins in mind, I have posed this last question to several friends and colleagues, and it is quite interesting to see how different the answers are.

Q -What sort of concepts would have to be communicated two ways between humans and dolphins, in order for you to consider it significant?

1. A colleague (professor in Philosophy of Ethics) answered:

"If, through language, you could show that dolphins have morality, I would consider it very significant. Actually, it would change my worldview."

This colleague bases his answer on the Kantian moral theory. According to Kant, morality is connected to rationality: moral rules are requirements of reason. Only humans can guide their conduct by reason. They have the capacity to set goals and make plans and then act on them. This special feature of human beings plays a central role in Kant's moral system. We don't put moral judgment on a lion that hunts its prey, but we would if a human would act the same way. That is because humans are players of the morality game. If you are taking part in the rules of what is a moral act and what is not, you have some moral obligations, and you are granted some moral rights, human rights. According to both Kant and my colleague, animals lack rational agency, and hence lack morality.

2. A friend and logician answered:

It would be fascinating and significant if you could show that dolphins were able to grasp the extended logic of IF...THEN... I am not talking specifically about the cause and effect nature of the phrase, "IF X happens THEN it will have consequence Y", but more in cases where the IF statement is false. For example, IF my father wasn't dead THEN I would spend more time with him than I did. This sentence is essentially saying: "but it is not so."

IF dolphins were able to grasp and express such sentences, THEN it would be significant, she said with a wry smile.

3. Another friend working in a kindergarten answered:

If dolphins were able to express concepts of family matters similar to what we have; perhaps exhibiting an understanding of concepts such as brother, uncle, or nephew. That would be significant.

4. Another answered:

If we were able to express similar feelings in a two-way communication paradigm it would be significant. I would not consider the standard "move Frisbee to surfboard" stuff significant, even if it was-two-ways.

5. Another answered:

If they could communicate to us what makes them happy, and a sense of beauty: a 'meaning of life statement', that would be significant. If we could learn something from them, instead of them learning from us, that would be very significant.

Physical Obstacles

Although these answers are all quite different, they do have something in common. What is considered significant for one individual is the stuff that he or she is personally interested in. The moral philosopher talks about morality, the logician about logic, the one who work with kids about family matters. In other words, we think it would be significant if dolphins were able to talk about issues relevant to us.

None of these people are cognitive scientists, and so they do not need to ponder a question such as: "What is it reasonable to assume that the agent can grasp?" I would like to mention one aspect of this question that has struck me as often neglected.

How does the environment the agent is exposed to affect the agent?

The environment I'm talking about is partly the natural environment of physical obstacles, predators and prey that has shaped all living creatures since the day they came into existence, but it can also be the social and cultural environment that social creatures are exposed to. The other beings/creatures/agents that our agent interacts with, shape its behavior.

Pattern Matching

One of the most fascinating aspects of the human brain is its diversity. We use it for so many different things. Some people learn to ride a unicycle and juggle seven balls in the air at the same time, while others learn to play musical instruments, or master rocket science. Our brains are plastic, and they get shaped differently by exposure to different environments.

This is not unique to human brains. Brains in general are pattern-matching devices. The environment that these brains are exposed to will determine which patterns the brains will detect and learn to recognize. Complex patterns require a more complex pattern matcher of course, but the functionality is the same.

Quite recently in evolutionary terms, humans have been exposed to, and learned to recognize, linguistic and cultural patterns. Genetically, there is no difference between modern people and Stone Age people. Culturally however, the difference is vast. Through language we benefit from the cognitive labors of others, so that a huge conceptual structure, collectively created long before we were born, guides our daily lives. This structure is not hardwired in our brains. It is not a biological, but a cultural phenomena. Exposure to this collective cognitive system is necessary in order to create an internal representation of it.

Language or Not

Suppose an unknown tribe were discovered, living in total isolation with no concept of the rest of the world and with a technological level equivalent to that of the Stone Age. If a new-born baby from this tribe were adopted and brought to New York City, it would grow up knowing just as much about computers and French fries, hip hop and fashion, as any other kid in the neighborhood. The child would have performed a quantum leap, bypassing endless steps of cultural evolution, just by entering into another cultural environment. Had the child grown up in its native tribe however, her brain would have been outfitted with Stone Age thoughts and knowledge instead.

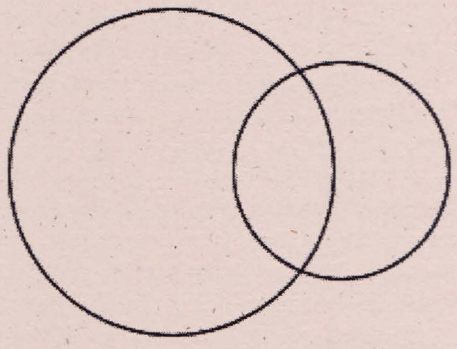
Dolphins and other cetaceans are smart creatures: impressively so. They have big brains, excellent short and long term memory, they live in complex social groups, vocalize socially, mimic well, etc. Some researchers believe they have a language of their own, and actually, whether we call it a language or not, we know that they communicate and, with some goodwill, we could classify them as 'intelligent communicative agents'.

Isn't it time we try to find out some more interesting things about them than whether they can jump through hoops? What if they were actually able to tap into our collective cognitive structure? To a certain extent, could it be analogous to the story of the Stone-age girl? To rule out the possibility without even trying, seems incredibly arrogant.

If we were to travel to a far-away place, and meet with some 'primitive' people,' some of us might focus on how different they are from us, and some might focus on the similarities. These people certainly think and speak in terms of cause and effect. Like us, they have concepts for fair/unfair, happy/unhappy, uncle, sister, and brother. They may not have concepts equivalent to hip-hop, fractal art, constitutional rights, and interest rate, and we may not have a word for that exotic musical beat of theirs, or that healing herb or that spiritual ritual. But through interaction, and exposure to these concepts, both parties have the chance to expand their conceptual structure in some ways.

What we get out of the interaction depends largely on how open we are, and how willing we are to expand our own conceptual structure. We may act as cultural imperialists, and believe that we have nothing to learn from them, but they have everything to learn from us. Or we can recognize the fact that they may have concepts alien to our own system, that could widen our horizons if we allowed them to enter.

Overlaps



A schematic illustration of overlapping concepts in two sets of conceptual structures.

Regarding dolphins and humans, there is no doubt that there is some overlap in conceptual structure. From empirical experiments, we know that dolphins can acquire concepts that are not part of their

natural environment, such as Frisbee, ball, hoop, and surfboard. What we don't know is where more interesting concepts such as fair/unfair, happy/unhappy, uncle, sister, and brother fit in. It should come as no surprise that if we wish to talk about things with more significance than "Frisbee, ball, and hoop," our common conceptual structure must also include a different vocabulary than Frisbee, ball, and hoop.

Could a closer tie, through language, to some other species be helpful to our own happiness, ethics, and even our evolution? We would certainly learn to show a different level of respect to these other beings. Could such a transformation in our attitudes to dolphins widen the membership to the club of "Who does it concern if we interfere with the environment in such and such way?"

Who should be granted membership in this club? It is no great leap of imagination to consider a more humble, responsible, and inclusive way of dealing with our planet as the outcome of such a transformation.

If so, it would be well worth the effort to try.

—Preben Wik, March 2003

Dolphins Evolve Thumbs

From: The Onion
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HONOLULU – In an announcement with grave implications for the primacy of the species of man, marine biologists at the Hawaii Oceanographic Institute reported Monday that dolphins, of the family Delphinidae, have evolved opposable thumbs on their pectoral fins.

"I believe I speak for the entire human race when I say, 'Holy mackerel,'" said Oceanographic Institute director Dr. James Aoki, noting that the dolphin has a cranial capacity 40 percent greater than that of humans. "That's it for us monkeys."

Aoki strongly urged humans, especially those living near the sea, to learn to communicate using a system of clicks and whistles in a frequency range of 4 to 150 kHz. He also encouraged humans to "start practicing their echolocation as soon as possible."

Delphinologists have reported more than seven thousand cases of spontaneous opposable-digit manifestation in the past two weeks alone. Thumbs have now been observed on the bottle-nosed dolphin, the Atlantic humpback dolphin, and even the rare Ganges River dolphin.

"It appears to be species-wide," said dolphin specialist Clifford Brees of the Kewalo Basin Marine Mammal Laboratory, speaking from the shark cage he welded shut around himself late Monday. "And it may be even worse: We haven't exactly been eager to check for thumbs on other marine mammals belonging to the order of cetaceans, such as the killer whale. We're really in the soup now."

Thus far, all the opposable digits encountered appear to be fully functional, making it possible for dolphins–believed to be capable of faster and more complex cogitation than man–to manipulate objects, fashion tools, and construct rudimentary pulley and lever systems.

"They really seem to be making up for lost time with this thumb thing," said Dr. Jim Kuczaj, a University of California–San Diego biologist who has studied the seasonal behavior of dolphins for more than 30 years. "Last Friday, a crude seaweed-and-shell abacus washed up on the beach near Hilo, Hawaii. The next day, a far more sophisticated abacus, fashioned from some unknown material and capable of calculating equations involving numbers of up to 16 digits, washed up on the same beach. The day after that, the beach was littered with thousands of what turned out to be coral-silicate and kelp-based bio-micro-circuitry."

"My goodness," Kuczaj added. "What are they doing down there?"

It is unknown what precipitated the dolphins' sudden development of opposable thumbs. Some dolphin behaviorists believe that the gentle marine mammal, pushed to the brink by humanity's reckless pollution and exploitation of the sea, tapped into some previously un-mined mental powers to spontaneously generate a thumb-like appendage.

"Scientists once wondered whether dolphins, with their remarkably advanced social and language structures, are actually smarter than we are," said Aoki, ushering reporters out of the laboratory. He then exclaimed "I wonder if we will become a zoo exhibit in the coming Dolphin Age."

Mystery Creature Washes Ashore in Chile

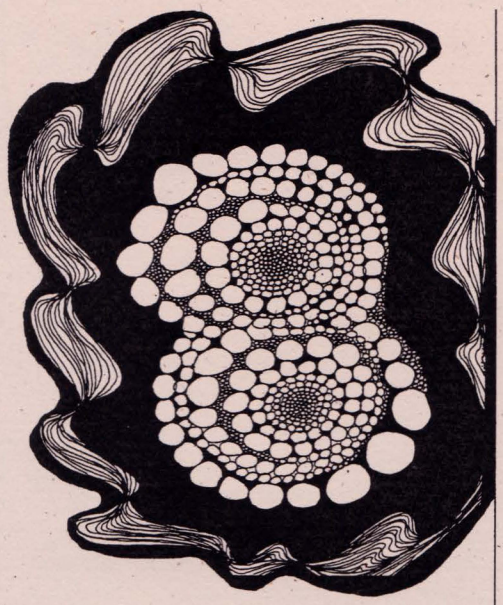
John Roach
National Geographic News

A mysterious, 41-foot-long and 19-foot-wide (12.4-meters by 5.4-meters) gelatinous mass of flesh recently washed ashore in southern Chile serves as reminder that the sea may be full of creatures yet discovered by humankind.

The creature was first thought to be a dead whale when it appeared on the coast near the town of Puerto Montt, but scientists who went to inspect the creature determined it was an invertebrate. "It had a very particular smell, very different from a dead cetacean and from anything we have smelled before," said Elsa Cabrera, director of the Center for Cetacean Conservation in Santiago, Chile.

After showing images of the fleshy blob to an Italian zoologist and comparing them to reports from a stranding off the coast of Florida in 1896, Cabrera said that the decomposing fleshy blob is most likely an octopus (*Octopus giganteus*).

The Center for Cetacean Conservation in Santiago is sending skin samples to international organizations to try and identify the species, which was originally discovered by the Chilean Navy floating alongside a dead humpback whale. "If the analysis confirms the finding of a giant octopus, it will be one step forward to increase our knowledge of the incredible creatures that are still unknown to humans," said Cabrera.



Interspecies Funding News

This organization is doing better financially than it was six months ago. Several individuals came through this winter with urgent funding, not only for operating expenses, but also for capital expenses of hardware and software.

In the past three months we have begun a disciplined search, both for new funding sources as well as for outside projects that might benefit from our own unique expertise and outreach. The Belly of the Whale Project (below) began with a small grant, but has now developed to the point that Greenmuseum.org's Sam Bower has just submitted a major grant to the Andy Warhol Foundation to take our collaborative project through the summer and fall.

As this newsletter goes to press, we are still awaiting word from the 2005 EXPO committee about our participation in next year's event in Japan. Intriguingly, our sister organization in Tokyo, ICERC, has just been accepted to present at the same event, and has offered an invitiation to Interspecies to participate as a partner. So even if the major funding happens to elude Interspecies, we still get to go.

But memerships are still down, and the operating budget dwindles drastically by September. So please help us if you can.

The Belly of the Whale Project

Last summer's newsletter reported on a new interspecies project being developed with the long term goal of opening up our audio library of animal calls to a much wider audience. It took several months to inventory the library (mostly archived on audio cassette and DAT) and then digitize a fair selection which highlighted the incredible diversity of animal calls, water sounds, and interspecies communication exchanges. That aspect of the project was sponsored by a grant from Greenmuseum.org.

Through the fall we kept busy editing what was finally several hundred individual audio selections, cleaning up the starts and stops, re-sampling some of it to create wonderful rhythms and weird sounds, all accomplished with an ear for providing looped audio material for digital composers and musicians. By January we had a CD's worth of workable audio samples from blue whales, cachalots, bowheads, grays, humpbacks, dolphins, belugas, orcas, Weddell and bearded seals, walrus, water sounds, lobsters, sea horses, and fish including grunts, and croakers. It is the world's first sample CD comprised of 100% underwater recordings.

Working closely with our collaborators at greenmuseum.org, we spent much of January developing a long list of some of the foremost techno musicians, soundscapists, and composers in the world. Over one long weekend in February, we sent the members of this illustrious group an invitation, to compose one piece of music, 2-6 minutes in length, focusing primarily on the sounds of our source CD. The invitation asked that the resultant music accentuate the sounds of the animals, with the important goal of "raising awareness of our endangered marine soundscapes by inspiring and engaging new audiences through the power of music.

We also asked that their contribution be considered a donation. If a profit is generated, the humble proceeds will be split equally to benefit future projects by the two sponsoring non-profits, Interspecies.com and greenmuseum.org.

Within a week, 40 composers from 12 different countries accepted the invitation to compose music for The Belly of the Whale Project. The CDs have been burned and sent out, and we now await for the music to arrive in our hands by April first.

Meanwhile Sam Bower from greenmuseum is busy fund raising for the next phase of the project. This will include sound editing and mastering of all the submissions, as well as the development of the interspecies.com and greenmuseum.org web sites. The music will reside on our web sites for anyone to download, free of charge. We also plan to produce an anthology CD featuring as many of the recorded selections as possible.

If any of our readers would like to participate, we need web design skills to begin to promote the project with potential music distributors.

The Interspecies DVD

A private grant last fall, permitted us to upgrade our studio to a new Apple G5 multimedia system with exceptional capability for audio, video, and DVD production.

The first effort on this new system is the creation of a DVD which includes a few pieces of music produced for the Belly of the Whale Project. One of these compositions is presented as a full fledged music video worthy of MTV, composed of footage from several Interspecies field projects. Another selection is a high-quality filmed slide show that exhibits art, photos, and graphs set to the sounds of several species of cetaceans.

Everyone here is pleased with the result. The DVD makes a grand statement about this organization, providing splendid media to spice up grant proposals. If there is enough interest in it, we plan to have it reproduced for sale.

If you'd like a copy right now, send $20 to Interspecies, and I'll put one in the mail.

Believe me, you'll like it!

Blue Whale Nursery Found

BBC News 12/11/03, By Paul Rincon BBC science staff

The iconic blue whale is the largest mammal on Earth and was driven to near-extinction by commercial whaling. Now, scientists have made the extraordinary discovery in Chile of a hidden nursery where blue whales go in large numbers to rear their young and to feed. The researchers claim the area, located in a sheltered network of fjords surrounded by dormant volcanoes, is one of the most important blue whale (Balaenoptera musculus) nursing grounds yet discovered in the southern hemisphere. Aerial and marine surveys in 2003 recorded at least 11 mother and calf pairings, suggesting the area was indeed being used to rear whale calves.

"It was amazing to discover something like this in 2003. One thinks this is not an era of discovery, but we still have much to learn," marine mammal ecologist Dr Rodrigo Hucke-Gaete, of the Universidad Austral de Chile, told BBC News Online.

The Chilean National Environmental Agency has endorsed a proposal towards declaring the area a protected marine park.

US Navy bombing right whale feeding grounds

Operations Occur as Congress Considers Environmental Exemptions for military.

The Brunswick Maine Naval Air Station is conducting bombing exercises within North Atlantic right whale habitat in the Gulf of Maine, according to information obtained by Public Employees for Environmental Responsibility (PEER). Live-fire training in the right whale habitat poses dangers for one of the most critically endangered whale populations on earth at a time when the Pentagon is proposing legislation to exempt itself from compliance with environmental laws.

For more info: http://www.peer.org/press/248.html

Japan finds new whale species

Ian Sample Thursday November 20, 2003, The Guardian

A new species of whale has been discovered by a team of scientists in Japan. The whale, which has a distinctly broad, flat head, belongs to the family of filter-feeding baleen whales, which includes most of the larger, toothless whales such as the minke and the blue whale.

The new species was discovered when a team of scientists led by Shiro Wada at the National Research Institute of Fisheries Science in Yokohama, re-examined the remains of eight whales caught by Japanese research ships in the 1970s. The rotting carcass of a ninth whale that was recovered from a remote island off the coast of Japan in 1998 was also examined. Analysis of the whales' DNA showed that they were all the same species, but were distinct from other species that marine biologists already knew about.

The researchers, who named the new species Balaenoptera omurai, described it as having an unusually shaped head and surprisingly few "baleen plates", the sheets of hair-like material that baleen whales use to filter food from the sea. The whales are at most 12m long. Mr Wada's colleague, Tadusa Yamada, of the National Science Museum in Tokyo, said the finding was important for helping countries to work out how to protect whales.

Justin Cooke, the World Conservation Society's representative at the International Whaling Commission, said that finding new whale species indicates just how little we know about whales. "It's relevant to the argument about whether enough is known about whales to justify killing them."

Parrot News

The finding of a parrot with an almost unparalleled power to communicatewith people has brought scientists up short. The bird, an African grey called N'kisi, has a vocabulary of 950 words, and shows signs of a sense of humour.

He invents his own words and phrases if he is confronted with novel ideas with which his existing repertoire cannot cope — just as a human child would do.

N'kisi is believed to be one of the most advanced users of human language in the animal world. About 100 words are needed for half of all reading in English, so if N'kisi could read he would be able to cope witha wide range of material.

He uses words in context, with past, present and future tenses, and is often inventive. One N'kisi-ism was "flied" for "flew", and another "pretty smell medicine" to describe the aromatherapy oils used by his owner, an artist based in NewYork.

When he first met Dr Jane Goodall, the renowned chimpanzee expert, after seeing her in a picture with apes, N'kisi said: "Got a chimp?"

He appears to fancy himself a humourist. When another parrot hung upside down from its perch, he commented: "You got to put this bird on the camera."

Dr Goodall says N'kisi's verbal fireworks are an "outstanding example ofinterspecies communication".

N'kisi's remarkable abilities appear to include telepathy as well. In an experiment, the bird and his owner were put in separate rooms and filmed as the artist opened random envelopes containing picture cards. Analysis showed the parrot had used appropriate keywords three times more often than would be likely by chance.

Professor Donald Broom, of the University of Cambridge's School ofVeterinary Medicine, said: "The more we look at the cognitive abilities ofanimals, the more advanced they appear, and the biggest leap of all has been with parrots."

Reviews

Soo-Roo

A CD blending clarinets, Indian percussion, Estonian guitar, electronic rhythms, and bird song.

Clarinetist David Rothenberg has long been a proponent of integrating sounds from nature into his music. In this recording, he focuses on the marsh warbler (Soo-roolind in Estonian)which does something no other bird is known to do. On its winter travels, it learns the songs of African birds and takes them back to its breeding grounds in Northern Europe and sings them one after another, with relentless complexity. These songs are the basis for the rhythms of the title piece.

The sounds of the birds flit in and out of the driving tabla rhythms giving a yearning exuberance to the music. You can hear ther CD at: http://www.soundgate.org/html/music.html

You can buy it online at: http://www.cdbaby.com/cd/drjwrj. Also find it at amazon.com and earthear.com

Blessed Pests of the Beloved West

An Affectionate Collection on Insects and their Kin, edited by Yvette Schnoeker-Shorb and Terril Shorb, [Native West press, 2003]

From the same editors and publishers who earlier gave us Least Loved Beasts, these two longtime Interspecies members have found a publishing niche that is both unique and captivating. With poems and prose chapters such as "The Joy and Wonder of Fear and Loathing" (about grasshoppers) and "A lousy Tale" (you got that one, right?) the writers' enthusiasm is contagious and their writing consistently elegant. The chapter about aphids on roses, by another Interspecies member, Joanne Lauck, is classic.

...The revulsion in handling these creatures is proportional to the assailant's capacity to experience disgust or at least to value cleanliness. And so the message from the lubbers (grasshoppers) seems particularly—if not solely—tuned to our senses and sensibilities. Modern culture has crafted from our natural fastidiousness a variety of behaviors far more biologically inane than the spectacles that we deem absurd. The peacock might prance and the stag might have enormous antlers, but we have embedded antibiotics in our plastics, our meat and our underwear.

...Now spring: ants scan my poems, replace my words,
recalculate my thoughts, write their own books...

...We have all learned that the presence of an insect, other than a ladybug, on a flower or vegetable plant means trouble is brewing, and it is just a matter of time before the plant is overwhelmed. Last summer, when a friend of mine took up organic gardening, she showed me a picture of a caterpillar that she had found on a parsley plant. Not wishing to harm it, she had plucked it off the plant and placed it on the trunk of a tree located a good distance from the garden. I questioned her: "You didn't have enough parsley to share with the caterpillar?" She looked at me blankly for a moment, and then stammered, "Well yes I have a whole row, but I thought if there was one, there would be hundreds, and they would take nit all." As it was, unless the caterpillar had the strength to crawl all the way back to its food source, or had already eaten enough to initiate its transformation into a butterfly, it probably died on the tree., and my friend lost a chance to help a yellow and black swallowtail butterfly emerge.

Rise, Ye Sea Slugs

1,000 holothurian haiku compiled and translated by Robin Gill. [Paraverse Press, 2003]

This book gets my vote for the most original literary theme of the decade. Apparently, sea cucumbers enjoy a long history as a common topic of Japanese haiku, perhaps vaguely analogous to the place of rabbits and mice in American cartoons. This book, by an American poet who lived in Japan for years, is the first and last critical statement on this genre, in English. The exposition offers an always eccentric, often profound, and occasionally riveting glimpse into haiku which is, like so much Japanese art, both simple and complex at the same moment.

...sea slug
a far cry from
apple pie

a sea slug
dropped and sinking
into snow

the sea slug
spills out his guts
to the jellyfish

We Want to Know Whales

Written on the observance of a whale stranding on Cape Cod. Submitted by Mary Zepernick, a friend of the deceased poet.

We want to know whales
We went to where the whales washed up,
We watered them there,
We wished we knew how to save them.
We dug the beach out under their fins,
We rocked them until the tide came in.
We talked to them. We touched them.
Two tons, ten feet long, their lungs
could collapse under such weight.
We want to hold them up in water.
How helpless we are with each other.
Under the whale where there are no arms
we put our arms. What harm the whale could do if she wanted to. She doesn't do it.
We don't know why. We don't know what else to do. We do this.
Whale what else is there to do?
In water without knowing what will happen
we hold to this enormous breathing dark shape, our faith.

—Ellen Anthony, Truro MA